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The vascular variability of the iliac system and clinical diagnosis in radiology and neurology

Al Talalwah, Waseem

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The vascular variability of the iliac system and clinical diagnosis in radiology and neurology

Waseem Al Talalwah

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University of Dundee

Analysis and result of the internal iliac artery branches and the sciatic nerve

Introduction

This study assesses the variability of arteries arising from the internal iliac artery which supplies the lower limb, as well as some from the external iliac artery. It also reviews the presence of the cardinal features of the sciatic artery including its classical features, as well as pathological findings and prognosis of sciatic artery aneurysm. Therefore, this research comprises 171 cadaver dissections and 171 patients reviewed in the literature. Missing values in the following table indicates the artery was not observed during dissection possibly due to it being previously dissected. Therefore, congenital absence of a sciatic artery has an incidence rate different to that from than a missing value. An accurate incidence of each artery origin and its branches is a valid result due to excluding the missing data. Consequently, the total of sample of each artery in each Table varies based on the missing data. The title of each table clearly explains it content. The tables are directly referred to in chapter4 in supporting the discussion and conclusions of this study.

I. Branches of anterior and posterior trunks

Anterior trunk

Table A.1: Anterior trunk branches

Branch	Frequency	Incidence (%)	Incidence without missing (%)	Missing
UMA	304	88.9	100	38
IGA	111	32.5	36.5	38
IPA	162	47.4	53.3	38
GPT	106	31	34.9	38
GOPT	13	3.8	4.3	38
OPT	3	0.9	1.0	38
OA	188	55	61	38
SA*	12	3.5	3.9	38
LSA	3	0.9	1.0	38

As the internal iliac artery bifurcates into anterior and posterior trunks, the anterior trunk divides into several arteries with variable incidence. This Table shows the significant arteries in relation to the sciatic artery theory and their characteristic in supply the sciatic nerve. Observations based on 342 specimens.
Sciatic artery is found to be double unilaterally; the first sciatic artery arose from anterior as well as from the posterior trunk in four cases. Therefore, it is a direct continuation of anterior trunk in 16 cases.

Posterior trunk

Table A.2: Posterior trunk branches

Branch	Frequency	Incidence (%)	Incidence without missing (%)	Missing
SGA	290	84.8	95.4	38
SA	49	14.3	16.1	38
ILA	298	67.8	77.9	44
LSA	235	68.7	79.1	45
OA	17	5.0	5.6	38
IGA	17	5.0	5.6	38
GPT	6	1.8	2.0	38

As the internal iliac artery bifurcates into anterior and posterior trunks, the posterior trunk divides into several ways giving various origins of incidence. Sciatic artery is found to be double unilaterally; the first sciatic artery arose from anterior as well as from the posterior trunk in four cases. Therefore, it is a direct continuation of posterior trunk in 53 cases. Observations based on 342 specimens.

Inferior gluteal artery

Table A.3: Inferior gluteal artery origin

Origin	Frequency	Incidence (%)	Incidence without missing (%)	Missing
AT alone	111	32.5	36.5	38
GPT (AT)	106	31	34.9	38
GOPT (AT)	13	3.8	4.3	38
GPT (PT)	6	1.8	2.0	38
PT alone	18	5.3	5.9	38
GPT interdivision	1	0.3	0.3	38
SA AT	6	1.8	2.0	38
SA PT	3	0.9	1.0	38
CAB	40	11.7	13.1	38

The inferior gluteal artery arose in different ways of different incidences. The highest incidence is from the anterior division indirectly whereas the second is directly. Also, the Table showes 40s occasion of congenital absence of the inferior gluteal artery replaced by the sciatic artery. Moreover, the inferior gluteal artery arose from the sciatic artery indicating a disagreement of embryological theory. Observations based on 342 specimens.

Table A.4: Inferior gluteal artery branches

Branch	Frequency	Incidence (%)	Incidence without missing (%)	Missing
LSA	16	4.7	5.4	45
ILA	1	0.3	0.3	38
SVA	2	0.6	0.7	38
MVA	3	0.9	1.0	38
IVA	7	2.0	2.3	38
MRA	11	3.2	3.6	38
IRA	5	1.5	1.6	38
UTA	1	0.3	0.3	38
OA	5	1.5	1.6	38
Sacral branch to S1	36	10.5	11.9	40
Sacral branch to S2	145	42.4	48.1	40
Sacral branch to S3	142	41.5	47.1	40
Sacral branch to S4	48	14.1	15.8	40

The inferior gluteal artery provides vesical and sciatic branches. It gives sciatic branches to the sciatic nerve roots: S1, S2, S3 and S4 during its course. Observations based on 342 specimens.

Table A.5: Inferior gluteal artery course

Branch	Frequency	Incidence (%)	Incidence without missing (%)	Missing
S1 & S2	36	10.5	11.9	40
S2 & S3	109	31.9	36.1	40
S3 & S4	33	9.6	10.9	40
passing below S4 or SN	15	4.4	5.0	40
Delayed arising GPT outside pelvis	68	19.9	22.5	40
Devoid by arose dorsal to SN	1	0.3	0.3	40
CAB	40	11.7	13.2	40

The inferior gluteal artery has a variable course passing between sacral roots at different levels. Observations based on 342 specimens.

Internal pudendal artery

Table A.6: Internal pudendal artery origin

Origin	Frequency	Incidence (%)	Incidence without missing (%)	Missing
AT IIA alone	162	47.4	53.3	38
GPT (AT)	106	31.0	34.9	38
GOPT (AT)	13	3.8	4.3	38
OPT (AT)	3	0.9	1.0	38
SA (AT)	8	2.3	2.6	38
SA (PT)	5	1.5	1.6	38
GPT (Interdivision)	1	0.3	0.3	38
GPT (PT)	6	1.8	2.0	38

The internal pudendal artery arose from the internal iliac artery dependently and independently. It has been observed to have different incidences arising from the internal iliac artery with other arteries as well as from its branches. Observations based on 342 specimens.

Table A.7: Internal pudendal artery branches

Branch	Frequency	Incidence (%)	Incidence without missing (%)	Missing
UTA	8	5.1	5.8	19
VGA	12	7.6	8.6	19
MRA	69	20.2	23.5	48
IRA	28	8.2	9.5	48
SVA	5	1.5	1.7	48
MVA	16	4.7	5.4	48
IVA	25	7.3	8.5	48

Internal pudendal artery gives several vesical branches. The middle rectal artery is a prominent branch compared to other vesical artery. Observations based on 342 specimens except the UTA and VGA are based 158 on 158.

Table A.8: Internal pudendal artery branch to sciatic nerve

Branch	Frequency	Incidence (%)	Incidence without missing (%)	Missing
LSA	1	0.3	0.3	45
S1	2	0.6	0.7	48
S2	54	15.8	18.4	48
S3	118	34.5	40.1	48
S4	139	40.6	47.3	48

Internal pudendal artery provides a supply to sacral sciatic roots via its course between them or its lateral sacral artery branch. Observations based on 342 specimens.

Table A.9: Internal pudendal artery course

Course	Frequency	Incidence (%)	Incidence without missing (%)	Missing
S1 & S2	2	0.6	0.7	48
S2 & S3	52	15.2	17.7	48
S3 & S4	66	19.3	22.4	48
Below S4	73	21.3	24.8	48
SF	33	9.6	11.2	48

Internal pudendal artery has a variable course. Observations based on 342 specimens. Observations based on 342 specimens.

Obturator artery

Table A.10: Obturator and its accessory origin of EIA

Origin	Frequency	Incidence (%)	Incidence without missing (%)	Missing
CT EIA	48	13.5	15.1	38
EIA alone	19	5.6	6.3	38
IEA	10	2.9	3.3	38
Total	75	21	24.7	38
low origin FA	2	0.6	0.7	38

The obturator and its accessory have an origin from the external iliac artery in different forms. Observations based on 342 specimens.

Table A.11: Obturator origin of IIA

Origin	Frequency	Incidence (%)	Incidence without missing (%)	Missing
PT SGA	21	6.1	6.9	38
SA	11	3.2	3.6	38
PT IIA (IN)	32	9.4	10.5	38
PT IIA (D)	17	5.0	5.6	38
PT IIA (T)	49	14.3	16.1	38
AT (GOPT)	13	3.8	4.3	38
AT OPT	3	0.9	1.0	38
UMA	2	0.6	0.7	38
IGA	5	1.5	1.6	38
AT IIA (IN)	23	6.7	7.6	38
AT IIA (D)	165	48.2	54.3	38
AT IIA (T)	188	55	61.8	38
Bifurcation	3	0.9	1.0	38

A few cases show a double obturator artery from the internal or external iliac system. In this case, the aberrant or accessory obturator artery may arise from either system. D: direct, IN: indirect and T: Total. Observations based on 342 specimens.

Table A.12: Obturator origin incidence according to IIA and EIA

Origin	Frequency	Incidence (%)	Incidence without missing (%)	Missing
IIA	236	69.0	77.6	38
EIA	67	19.6	22.0	38
CT EIA	42	12.3	13.8	38
EIA Alone	17	5.0	5.6	38
IEA	8	2.3	2.6	38
FA	1	0.3	0.3	38

The obturator artery frequently arises from the internal iliac artery. It has been observed that the external iliac artery is also a source of origin. Observations based on 342 specimens.

Table A.13: Aberrant Obturator incidence according to IIA and EIA

Origin	Frequency	Incidence (%)	Incidence without missing (%)	Missing
Total	12	3.5	3.9	38
CT EIA	4	1.2	1.3	38
EIA alone	3	0.9	1.0	38
IEA	1	0.3	0.3	38
AT IIA	1	0.3	0.3	38
PTIIA	3	0.9	1.0	38
FA	1	0.3	0.3	38

The aberrant obturator artery frequently arose from the external iliac artery. It has been observed that the internal iliac artery is also a source of origin. Observations based on 342 specimens.

Table A.14: Obturator artery branches

Branch	Frequency	Incidence (%)	Incidence without missing (%)	Missing
SVA	2	0.6	0.7	37
IVA	1	0.5	0.6	24
UTA	2	1.3	1.4	13
VGA	1	0.6	0.7	13
Psoas Br	8	2.3	2.6	37
Iliacus Br	8	2.3	2.6	37
MRA	1	0.3	0.3	37
IRA	1	0.3	0.3	37

The obturator artery gives several vesical branches as well as muscular branches. The muscular branch is a compensatory branch in cases of congenital absent of the iliolumbar artery. Observations based on 342 specimens except the UTA and VGA based on 158 and IVA based on 184.

Gluteopudendal trunk

Table A.15: Origin of Gluteopudendal trunk

Origin	Frequency	Incidence (%)	Incidence without missing (%)	Missing
GPT (AT)	106	31	34.9	38
GOPT (AT)	13	3.8	4.3	38
GPT (PT)	6	1.8	2.0	38
GPT interdivision	1	0.3	0.3	38
CAB	178	52.0	58.5	38
Total	126	36.9	41.5	38

The gluteopudendal trunk usually arose from the anterior division of the internal iliac artery. In a few cases, it arose from the posterior division and was observed to give the obturator artery in few specimens. However, it arose from the internal iliac artery bifurcation site in one specimen. This trunk has been observed to be congenital absent frequently due to the inferior gluteal and internal pudendal artery arose independently. Observations based on 342 specimens.

Table A.16: Gluteopudendal trunk course

Origin	Frequency	Incidence (%)	Incidence without missing (%)	Missing
Early division	66	19.3	21.7	38
Below S4	25	7.3	8.2	38
CAB	178	52.1	58.5	38
S2 & S3	13	3.8	4.3	38
S3 & S4	3	0.9	1.0	38
Sciatic formation	19	5.6	6.3	38

Gluteopudendal trunk has a variable course within pelvis in relation to the sciatic nerve or its roots in cases of delay bifurcation, while it does not in cases of early bifurcation. It also penetrates the sciatic formation or passes below s4 in few specimens. Observations based on 342 specimens.

Table A.17: Gluteopudendal trunk supply S1, S2, S3, S4 root & sciatic formation

Branch	Frequency	Incidence (%)	Incidence without missing (%)	Missing
S1	0	0	0	38
S2	13	3.8	4.3	38
S3	16	4.7	5.3	38
S4	3	0.9	1.0	38
Sciatic formation	19	5.6	6.2	38

As the gluteopudendal trunk passs between the sacral roots, it supplies S1, S2, S3, S4 root as well as the sciatic formation in delayed division. Observations based on 342 specimens.

Superior gluteal artery

Table A.18: Superior gluteal artery origin

Origin	Frequency	Incidence (%)	Incidence without missing (%)	Missing
PT IIA	290	84.8	95.4	38
SA	12	3.5	3.9	38
CAB	2	0.6	0.7	38

The superior gluteal artery was a continuation of the posterior trunk of the internal iliac artery. Except in a few cases where it arose from the sciatic artery arising from the posterior trunk. Occasionally, it was found to be congenital absent as the sciatic artery was a compensatory artery. Observations based on 342 specimens.

Table A.19: Superior gluteal artery branches

Branch	Frequency	Incidence (%)	Incidence without missing (%)	Missing
LSA	50	14.6	16.7	43
PSA	7	2.0	2.3	36
OA	21	6.1	6.9	37
ILA	1	0.3	0.3	42

Frequently, the superior gluteal artery was found to give several branches to the sciatic nerve directly or indirectly via either a persistent sciatic, lateral sacral or iliolumbar artery. Occasionally, it found to be a source of blood supply to the medial compartment of the thigh as it gave obturator artery. Observations based on 342 specimens.

Table A.20: Superior gluteal artery course

Course	Frequency	Incidence (%)	Incidence without missing (%)	Missing
LS & S1	264	77.2	86.8	38
Above LS	26	7.6	8.6	38
Arise dorsally	12	3.5	3.9	38
CAB	2	0.6	0.7	38

The superior gluteal artery frequently passed the lumbosacral trunk and S1 whereas it infrequently passed above lumbsacral trunk. Rarely, it found to be behind sciatic formation as it arose from the sciatic artery. Observations based on 342 specimens.

Lateral sacral artery

Table A.21: Lateral sacral artery origin

Origin	Frequency	Incidence (%)	Incidence without missing (%)	Missing
AT IIA	3	0.9	1.0	45
DM IIA	11	3.2	3.7	45
PT IIA	235	68.7	79.1	45
SGA	50	14.6	16.8	45
IGA	16	4.7	5.4	45
IPA	1	0.3	0.3	45
SA	26	7.6	8.8	45
CAB	1	0.3	0.3	45

The lateral sacral artery commonly arose from the posterior trunk of the internal iliac artery. Occasionally, it arose from different arteries. Observations based on 342 specimens.

Table A.22: Lateral sacral artery number

Number	Frequency	Incidence (%)	Incidence without missing (%)	Missing
One	230	67.3	77.2	45
Double	59	17.3	19.8	45
Triple	7	2.0	2.3	45
Quadruple	1	0.3	0.3	45
CAB	1	0.3	0.3	45

The lateral sacral artery commonly arose from the internal iliac artery in different numbers, but was found to be absent in one specimen. Observations based on 342 specimens.

Iliolumbar artery

Table A.23: Iliolumbar artery origin

Origin	Frequency	Incidence (%)	Incidence without missing (%)	Missing
CIA	6	1.8	2.0	44
EIA	1	0.3	0.3	44
PA IIA	3	0.9	1.0	44
DM IIA	38	11.1	12.8	44
PT IIA	232	67.8	77.9	44
SGA	2	0.6	0.7	44
IGA	1	0.3	0.3	44
SA	1	0.3	0.3	44
CAB	14	4.1	4.7	44

The iliolumbar artery commonly arose from the posterior trunk of the internal iliac artery. Occasionally, it arose from different arteries. Observations based on 342 specimens.

Table A.24: Number of Iliolumbar artery

Number	Frequency	Incidence (%)	Incidence without missing (%)	Missing
One	282	82.5	94.6	44
Two	2	0.6	0.7	44
Zero	14	4.1	4.7	44

The iliolumbar artery commonly arose from the internal iliac artery either single or double. It was absent in a few cases. Observations based on 342 specimens.

Sciatic artery

Table A.25: Sciatic artery origin

Origin	Frequency	Incidence (%)	Incidence without missing (%)	Missing
AT IIA	12	3.5	3.9	38
AT & PT	4	1.2	1.3	38
IPA	1	0.3	0.3	38
CAB	236	69	77.6	38
PT IIA	44	12.9	14.5	38
SGA	7	2	2.3	38

The sciatic artery frequently arose from the posterior trunk of the internal iliac artery directly and indirectly. However, it also arose from the anterior trunk directly and indirectly. It found to be double arising from both trunks. Observations based on 342 specimens.

Table A.26: Sciatic artery origin in both genders

Origin	Gender	Frequency	Incidence (%)	Incidence without missing (%)	Missing
AT IIA	F	3	1.9	2.1	14
	M	9	4.9	5.6	24
AT & PT	F	2	1.3	1.4	14
	M	2	1.1	1.3	24
IPA	F	0	0	0	14
	M	1	0.5	0.6	24
CAB	F	111	70.3	77.1	14
	M	125	67.9	78.1	24
PT IIA	F	21	13.3	14.6	14
	M	23	12.5	14.4	24
SGA	F	7	4.4	4.9	14
	M	0	0	0	24

The sciatic artery found to be more common in males then females. Observations based on 184 and 158 specimens respectively.

Table A.27: Anatomical classification of the sciatic artery based on origin

Origin	Frequency	Incidence (%)	Incidence without missing (%)	Missing
AT PAA & PT PSA	1	0.3	0.3	38
AT PSA & PT PAA	1	0.3	0.3	38
AT PSA & PT PAA	2	0.6	0.7	38
PAA	54	15.8	17.8	38
PSA	10	2.9	3.3	38

The sciatic artery is classified anatomically into persistent sciatic and axial artery developing from the primitive sciatic and axial artery. Occasionally, the primitive axial artery becomes the persistent sciatic artery. Observations based on 342 specimens.

Table A.28: Embryological classification of the sciatic artery based on origin

Origin	Frequency	Incidence (%)	Incidence without missing (%)	Missing
AT PrAA & PT PrSA	1	0.3	0.3	38
AT or PT is either PrSA or PrAA	1	0.3	0.3	38
PrSA PrAA	2	0.6	0.7	38
Primitive sciatic or axial artery	1	0.3	0.3	38
PrSA	1	0.3	0.3	38
PrAA	62	18.1	20.4	38

The primitive axial artery usually becomes the persistent axial artery but it occasionally becomes the persistent axial artery. In one case, it was difficult to classify the sciatic artery as either primitive sciatic or axial artery. Observations based on 342 specimens.

Table A.29: Sciatic artery branches

Branches	Frequency	Incidence (%)	Incidence without missing (%)	Missing
IGA	9	2.6	3.0	38
SGA	12	3.5	4.0	38
OA	11	3.2	3.6	38
LSA	26	7.6	8.8	45
ILA	1	0.3	0.3	44
UTA	3	1.9	2.1	18
VGA	2	1.3	1.4	12
MRA	7	2.0	2.3	36
IPA	13	3.8	4.3	38
LS	8	2.3	2.6	37
S1	17	5.0	5.6	37
S2	25	7.3	8.2	37
S3	17	5.0	5.6	37
S4	1	0.3	0.3	37
SF	7	2.0	2.3	37

The sciatic artery gives several branches inside the pelvis such as superior and inferior gluteal artery, obturator, internal pudendal, lateral sacral and various sacral branches. It also, provides vesical branches to the uterus, vagina and rectum such as uterine, vaginal and middle rectal artery. Observations based on 342 specimens except the UTA and VGA are based on 158 specimens.

Table A.30: Sciatic artery branches in both genders

Branches	Gender	Frequency	Incidence (%)	Incidence without missing (%)	Missing
IGA	**F**	2	1.3	1.4	14
	M	7	3.8	4.4	24
SGA	**F**	5	3.2	3.5	14
	M	7	3.5	4.4	24
OA	**F**	6	3.8	4.2	15
	M	5	2.7	3.1	23
LSA	**F**	16	10.1	11.2	15
	M	10	5.4	6.5	30
ILA	**F**	0	0	0	18
	M	1	0.5	0.6	26
UTA	**F**	3	1.9	2.1	18
	M	0	0	0	26
VGA	**F**	2	1.3	1.4	12
	M	0	0	0	24
MRA	**F**	4	2.5	2.7	12
	M	3	1.6	1.9	24
IPA	**F**	7	3.5	4.9	14
	M	6	3.3	3.8	24
LS	**F**	4	2.5	2.8	14
	M	4	2.2	2.5	24
S1	**F**	10	6.3	6.9	14
	M	7	3.8	4.4	24
S2	**F**	14	8.9	9.7	14
	M	11	6	6.9	24
S3	**F**	9	5.7	6.3	14
	M	8	4.3	5.0	24
S4	**F**	1	0.6	0.7	14
	M	0	0	0	24
SF	**F**	2	1.3	1.4	14
	M	5	2.7	3.1	24

Within the pelvis, the sciatic artery gives several branches during its course, which differ in incidence according to gender. Observations based on male (184) and female (158) specimens.

Table A.31: Sciatic artery course in relation to the sciatic nerve root

Course	Frequency	Incidence (%)	Incidence without missing (%)	Missing
LS1 & S1	7	2.0	2.3	38
S1 & S2	11	3.2	3.2	38
S2 & S3	23	6.7	7.6	38
S3 & S4	1	0.3	0.3	38
Penetration SF	8	2.3	2.6	38
Double Sciatic pass between S2 & S3 and S3 & S4	2	0.6	0.7	38
Dorsal To SN roots	13	3.8	4.3	38
Arose at gluteal*	1	0.3	0.3	38
Arose dorsal to SF	2	0.6	0.7	38

Inside the pelvis, the sciatic artery gives a supply to the sciatic nerve during its course either directly or indirectly. In one specimen, the internal pudendal artery supplies the sciatic nerve by penetrating the sciatic artery in the gluteal region. Observations based on 342 specimens.

Table A.32: Sciatic artery course in relation to the sciatic formation

Course	Frequency	Incidence (%)	Incidence without missing (%)	Missing
Double SA one pass ventral & other dorsal	2	0.6	0.7	38
Dorsal only	20	5.8	5.8	38
Irrelevant (IPA)	1	0.3	0.3	38
Ventral only	9	2.6	2.6	38
Ventral then dorsal course	36	10.5	11.6	38

The sciatic artery has a variable course in relation to the sciatic formation providing its supply in different ways. Frequently, it supplies the dorsal aspect of the sciatic formation. Observations based on 342 specimens.

Table A.33: Sciatic artery course in relation to piriformis

Course	Frequency	Incidence (%)	Incidence without missing (%)	Missing
Superior to piriformis	2	0.6	0.7	38
Inferior to piriformis only	65	19.1	21.4	38
Irrelevant (IPA)	1	0.3	0.3	38

The sciatic artery passes piriformis either superiorly or inferiorly. Based on this study, the sciatic artery prefers to pass inferior course than superior through infrapiriformis canal. Observations based on 342 specimens.

Table A.34: Unilateral and bilateral incidence of sciatic artery

Case	Frequency	Incidence (%)	Incidence without missing (%)	Missing
Cadaveric studies	68	19.9	22.4	38
Unilateral	28	8.2	9.2	38
Bilateral	20	5.8	6.5	38
Population	48	28.1	-	-
Unilateral	28	16.4	-	-
Bilateral	20	11.7	-	-
PSA	54	15.8	17.8	38
PAA	10	2.9	3.3	38
Double PSA & PAA	4	1.2	1.3	38

Based on this anatomy study, unilateral sciatic artery has recorded at a higher rate than the bilateral sciatic artery. Based on classification, persistent sciatic artery occurs more than the persistent axial artery. Observations based on 342 specimens except the uni and bilateral incidence based on 171 patients.

Table A.35: Sciatic artery origin in 68 cases

Origin	Frequency	Incidence (%)	Incidence without missing (%)	Missing
AT IIA	12	17.6	17.6	0
AT & PT	4	5.9	5.9	0
IPA	1	1.5	1.5	0
PT IIA	44	64.7	64.7	0
SGA	7	10.3	10.3	0

The sciatic artery frequently arose directly and indirectly from the posterior trunk of the internal iliac artery, whereas it frequently arose indirectly from the anterior trunk from internal pudendal artery. Observations based on 68 specimens.

Table A.36: Sciatic artery origin in both genders of 68 cases

Origin	Gender	Frequency	Incidence (%)	Incidence without missing (%)	Missing
AT IIA	F	3	9.1	9.1	0
	M	9	25.7	25.7	0
AT & PT	F	2	6.1	6.1	0
	M	2	5.7	5.7	0
IPA	F	0	0	0	0
	M	1	3.0	3.0	0
PT IIA	F	21	63.6	63.6	0
	M	23	65.7	65.7	0
SGA	F	7	21.2	21.2	0
	M	0	0	0	0

The anterior trunk was found to be an origin of the sciatic artery more in males but has a less common origin from the posterior trunk. The sciatic artery arising from the posterior trunk has a different incidence in both genders. Observations based on 68 specimens (Female: 33 specimens and male: 35 specimens).

II. Variability of internal iliac artery branches in relation to sciatic artery coexistence in European population

Table A.37: Inferior gluteal artery origin variability associated with coexistence of sciatic artery in European population

Origin	Frequency	Incidence (%)	Incidence without missing (%)	Missing
AT alone	6	1.8	2.0	38
GPT (AT)	8	2.3	2.6	38
GOPT (AT)	1	0.3	0.3	38
GPT (PT)	0	0	0	38
PT alone	2	0.6	0.7	38
GPT interdivision	0	0	0	38
SA AT	6	1.8	2.0	38
SA PT	3	0.9	1.0	38
CAB	40	11.7	13.2	38

In coexistent sciatic artery, the most common origin of the inferior gluteal artery is the gluteopudendal trunk. It was congenitally absent in 13.2% but it presented in 8.6%. Observations based on 342 specimens.

Table A.38: Internal pudendal artery origin with sciatic artery coexistence in European population

Origin	Frequency	Incidence (%)	Incidence without missing (%)	Missing
AT IIA alone	43	12.6	14.1	38
GPT (AT)	8	23.4	2.6	38
GOPT (AT)	1	0.3	0.3	38
OPT (AT)	1	0.3	0.3	38
SA (AT)	9	2.9	3.0	38
SA (PT)	4	1.2	1.3	38
GPT (Interdivision)	0	0	0	38
GPT (PT)	0	0	0	38

In coexistent sciatic artery, the internal pudendal artery has been regularly observed to arise from the anterior trunk of the internal iliac artery independently. Observations based on 342 specimens.

Table A.39: Obturator artery and accessory obturator origin from EIA with a coexistent sciatic artery in European population

Origin	Frequency	Incidence (%)	Incidence without missing (%)	Missing
CT EIA	17	5.0	5.6	38
EIA Alone	7	2.0	2.3	38
IEA	2	0.6	0.7	38
TOTAL	26	7.6	8.6	38
low origin FA	1	0.3	0.3	38

The obturator artery and its accessory have various origins arising from the external iliac artery in case of coexistent sciatic artery, such as the common trunk of the inferior epigastric and obturator arteries. Observations based on 342 specimens.

Table A.40: Obturator artery and accessory obturator origin from IIA with coexistent sciatic artery in European population

Origin	Frequency	Incidence (%)	Incidence without missing (%)	Missing
PT SGA	9	2.6	3	38
SA	11	3.2	3.6	38
PT IIA (IN)	20	5.8	6.6	38
PT IIA (D)	6	1.8	2	38
PT IIA (T)	26	7.6	8.6	38
AT (GOPT)	0	0	0	38
AT OPT	1	0.3	0.3	38
UMA	1	0.3	0.3	38
IGA	0	0	0	38
AT IIA (IN)	2	0.6	0.7	38
AT IIA (D)	17	5	5.6	38
AT IIA (T)	19	5.6	6.3	38
Bifurcation	0	0	0	38

According to internal iliac artery origin with respect to a coexistent sciatic artery, the obturator artery and its accessory were observed to have various forms with the posterior trunk being the common origin. Observations based on 342 specimens.

Table A.41: Obturator origin incidence according to IIA and EIA with coexistence of sciatic artery in European population

Origin	Frequency	Incidence (%)	Incidence without missing (%)	Missing
IIA	42	12.3	13.8	38
EIA	24	7.0	7.9	38
CT EIA	16	4.7	5.3	38
EIA alone	6	1.8	2.0	38
IEA	2	0.6	0.7	38
FA	1	0.3	0.3	38

According to internal and external iliac artery origin with respect to a coexistent sciatic artery, the obturator artery has been observed to have various forms with the posterior trunk being the common origin. Observations based on 342 specimens.

Table A.42: Aberrant Obturator incidence according to IIA and EIA with coexistent sciatic artery in European population

Origin	Frequency	Incidence (%)	Incidence without missing (%)	Missing
Total	5	1.5	1.5	38
CT EIA	1	0.3	0.3	38
EIA alone	1	0.3	0.3	38
IEA	0	0	0	38
AT IIA	0	0	0	38
PTIIA	3	0.9	1.0	38
FA	0	0	0	38

Aberrant obturator frequently arises from the external iliac artery and posterior trunk of internal iliac artery in cases of sciatic artery attendance. Observations based on 342 specimens.

Table A.43: Variability of origin of the gluteopudendal trunk associated with sciatic artery coexistence in European population

Origin	Frequency	Incidence (%)	Incidence without missing (%)	Missing
GPT (AT)	8	2.3	2.6	38
GOPT (AT)	1	0.3	0.3	38
GPT (PT)	0	0	0	38
GPT bifurcation	0	0	0	38
CAB	40	11.7	13.2	38
Total	9	2.6	3.0	38

The gluteopudendal trunk frequently congenitally absent in cases of sciatic artery persistence. Observations based on 342 specimens.

Table A.44: Variability of origin of the superior gluteal artery associated with sciatic artery coexistence in European population

Origin	Frequency	Incidence (%)	Incidence without missing (%)	Missing
PT IIA	52	15.5	17.1	38
SA	12	3.5	3.9	38
CAB	2	0.6	0.7	38

The superior gluteal artery is a standard branch of the posterior trunk directly. Observations based on 342 specimens.

Table A.45: Variability of origin of the lateral sacral artery associated with sciatic artery coexistence in European population

Origin	Frequency	Incidence (%)	Incidence without missing (%)	Missing
AT IIA	0	0	0	45
DM IIA	4	1.2	1.3	45
PT IIA	37	10.8	12.5	45
SGA	10	29.2	3.4	45
IGA	3	0.9	1.0	45
IPA	1	0.3	0.3	45
SA	26	7.6	8.8	45
CAB	1	0.3	0.3	45

In case of sciatic artery coexistence, this study observed the lateral sacral artery frequently arising from the posterior trunk directly and indirectly, from either the sciatic artery or superior gluteal artery. Observations based on 342 specimens.

Table A.46: Variability of origins of the iliolumbar artery associated with sciatic artery coexistence in European population

Origin	Frequency	Incidence (%)	Incidence without missing (%)	Missing
CIA	0	0	0	44
EIA	0	0	0	44
PA IIA	2	0.6	0.7	44
DM IIA	12	3.5	4.0	44
PT IIA	46	13.5	15.4	44
SGA	0	0	0	44
IGA	1	0.3	0.3	44
SA	1	0.3	0.3	44
CAB	3	0.9	1.0	44

The iliolumbar artery frequently originates from the posterior trunk and from the internal iliac artery while it rarely arises from the sciatic artery. Observations based on 342 specimens.

III. Variability of internal iliac artery branches in sciatic artery cases in European population

Table A.47: Variability of origins of the inferior gluteal artery in of sciatic artery cases

Origin	Frequency	Incidence (%)	Incidence without missing (%)	Missing
AT alone	6	8.8	9.1	2
GPT (AT)	8	11.8	12.1	2
GOPT (AT)	1	1.5	1.5	2
GPT (PT)	0	0	0	2
PT alone	2	2.9	3	2
GPT bifurcation	0	0	0	2
SA AT	6	8.8	9.1	2
SA PT	3	4.4	4.5	2
CAB	40	58.8	60.6	2

In cases of sciatic artery coexistence, the inferior gluteal artery is frequently absent. It presents in a different form of origin when the sciatic artery present. Observations based on 68 specimens.

Table A.48: Variability of origins of the internal pudendal artery in sciatic artery cases

Origin	Frequency	Incidence (%)	Incidence without missing (%)	Missing
AT IIA alone	43	63.2	65.2	2
GPT (AT)	8	11.8	12.1	2
GOPT (AT)	1	1.5	1.5	2
OPT (AT)	1	1.5	1.5	2
SA (AT)	9	13.2	13.6	2
SA (PT)	4	5.9	6.1	2
GPT Interdivision	0	0	0	2
GPT (PT)	0	0	0	2

The internal pudendal artery arose from different origins in sciatic artery coexistence cases. It commonly arises from the anterior trunk independently and dependently from gluteopudendal trunk or the sciatic artery. Observations based on 68 specimens.

Table A.49: Variability of origins of the obturator artery and its accessory from EIA in sciatic cases

Origin	Frequency	Incidence (%)	Incidence without missing (%)	Missing
CT EIA	17	25.0	25.4	1
EIA alone	7	10.3	10.4	1
IEA	2	2.9	3.0	1
Total	26	38.2	38.8	1
FA	1	1.5	1.5	1

In sciatic artery coexistence, the obturator artery presents with different origins from the external iliac artery. It commonly arises with inferior epigastric artery from the external iliac artery. Observations based on 68 specimens.

Table A.50: Obturator artery origin of IIA in sciatic cases

Origin	Frequency	Incidence (%)	Incidence without missing (%)	Missing
PT SGA	9	13.2	13.4	1
SA	11	16.2	16.4	1
PT IIA (IN)	20	29.4	29.9	1
PT IIA (D)	6	8.8	9	1
PT IIA (T)	26	38.2	38.8	1
AT (GOPT)	0	0	0	1
AT OPT	1	1.5	1.5	1
UMA	1	1.5	1.5	1
IGA	0	0	0	1
AT IIA (IN)	2	2.9	3	1
AT IIA (D)	17	25.0	25.4	1
AT IIA (T)	19	27.9	28.4	1
Bifurcation	0	0	0	1

In sciatic artery coexistence cases, the obturator artery frequently arose from different origin of the internal iliac artery. Observations based on 68 specimens.

Table A.51: Obturator origin incidence according to IIA and EIA in sciatic cases

Origin	Frequency	Incidence (%)	Incidence without missing (%)	Missing
IIA	42	61.8	62.7	1
EIA	24	35.3	35.8	1
CT EIA	16	23.5	23.9	1
EIA alone	6	8.8	9.0	1
IEA	2	2.9	3.0	1
FA	1	1.5	1.5	1

Generally, the obturator artery arises from the internal iliac system more than the external one. Occasionally, it arises from the femoral artery, Observations based on 68 specimens.

Table A.52: Aberrant obturator artery incidence according to IIA and EIA in sciatic cases

Origin	Frequency	Incidence (%)	Incidence without missing (%)	Missing
CT EIA	1	1.5	1.5	1
EIA independently	1	1.5	1.5	1
IEA	0	0	0	1
AT IIA	0	0	0	1
PTIIA	3	4.4	4.5	1
TOTAL	5	7.4	7.5	1
FA	0	0	0	1

In almost 50%, accessory obturator artery arose in association with the sciatic artery. Observations based on 68 specimens.

Table A.53: Variability of origin of the gluteopudendal trunk in sciatic cases

Origin	Frequency	Incidence (%)	Incidence without missing (%)	Missing
GPT (AT)	8	11.8	12.1	2
GOPT (AT)	1	1.5	1.5	2
GPT (PT)	0	0	0	2
GPT bifurcation	0	0	0	2
CAB	40	58.8	60.6	2
Total	9	13.2	13.6	2

The gluteopudendal trunk is usually found to be absent in cases of the sciatic artery persistence. However, it has presented in association of the sciatic artery in almost 25%. Observations based on 68 specimens.

Table A.54: Variability of origins of the superior gluteal artery in sciatic cases

Origin	Frequency	Incidence (%)	Incidence without missing (%)	Missing
PT IIA	52	76.4	78.9	2
PSA	12	17.6	18.1	2
CAB	2	2.9	3.0	2

The superior gluteal artery commonly arises from the posterior trunk directly in sciatic artery cases. It was found to be a branch of the sciatic artery. It is rarely found to be absent in cases of sciatic artery presence. Observations based on 68 specimens.

Table A.55: Variability of the course of the superior gluteal artery in sciatic artery cases

Origin	Frequency	Incidence (%)	Incidence without missing (%)	Missing
LS & S1	43	63.2	65.2	2
Above LS	10	14.7	15.4	2
Arise dorsally	11	16.2	16.7	2
CAB	2	2.9	3.0	2

The superior gluteal artery usually passes between the lumbosacral trunk and S1 sacral root. It was found to have different course in cases of persistent sciatic artery. Observations based on 68 specimens.

Table A.56: Variability of origins of the lateral sacral artery in sciatic artery cases

Origin	Frequency	Incidence (%)	Incidence without missing (%)	Missing
AT IIA	0	0	0	2
DM IIA	4	5.9	6.1	2
PT IIA	37	54.4	56.1	2
SGA	10	14.7	15.2	2
IGA	3	4.4	4.5	2
IPA	1	1.5	1.5	2
SA	26	38.2	39.4	2
CAB	1	1.5	1.5	3

The lateral sacral artery shows variability of origin in cases of sciatic artery persistence. It commonest origin was from the posterior trunk while the second commonest origin was from the sciatic artery. Observations based on 68 specimens.

Table A.57: Variability of origin of the iliolumbar artery in sciatic artery cases

Origin	Frequency	Incidence (%)	Incidence without missing (%)	Missing
CIA	0	0	0	3
EIA	0	0	0	3
PA IIA	2	2.9	3.1	3
DM IIA	12	17.6	18.5	3
PT IIA	46	67.6	70.8	3
SGA	0	0	0	3
IGA	1	1.5	1.5	3
SA	1	1.5	1.5	3
CAB	3	4.4	4.6	3

The iliolumbar artery arose with the first and second highest rate from the posterior trunk and internal iliac artery. Observations based on 68 specimens.

Table A.58: Superior gluteal artery branches in the gluteal region

Branches	Frequency	Incidence (%)	Incidence without missing (%)	Missing
CAB	2	0.6	0.7	50
Anastomotic Br	290	84.8	99.3	50
Direct Sciatic Br	2	0.6	0.7	50
Indirect Sciatic Br	8	2.3	2.8	57

In the gluteal region, the superior gluteal artery sends an anastomotic branch and sciatic branches to supply the hip joint and sciatic nerve. Observations based on 342 specimens.

Table A.59: Inferior gluteal artery branches in the gluteal region

Branches	Frequency	Incidence (%)	Incidence without missing (%)	Missing
Ar Br	234	68.4	81.0	58
Ar Br V TO SN	8	2.3	2.8	58
Ar Br D TO SN	225	65.8	79.2	58
Ar Br V & D TO SN	1	0.3	0.4	58
Sciatic Br	244	70.8	84.1	52
S Br V to SN	1	0.3	0.3	54
S Br D to SN	240	70.2	83.3	54
S Br V & D TO SN	1	0.3	0.3	54
IGA penetrate SN	9	2.6	3.1	48
CAB	40	11.7	14.1	58

The inferior gluteal artery supplies the hip joint and sciatic nerve by anastomotic and sciatic branches. These branches have several courses in relation to the sciatic nerve passing in front or behind and penetrating. Observations based on 342 specimens.

Table A.60: Internal pudendal artery branches in the gluteal region

Branches	Frequency	Incidence (%)	Incidence without missing (%)	Missing
Sciatic Br	12	3.5	4.2	58
Sciatic Br ventral to SN	7	2.0	2.5	58
Sciatic Br medial to SN	2	0.6	0.7	58
Sciatic Br medial then dorsal to SN	1	0.3	0.4	58
Sciatic Br medial then vental to SN	2	0.6	0.7	58
Sciatic artery	1	0.3	0.4	58
Sciatic artery give articular Br	1	0.3	0.4	58
Sciatic artery penetrate the SN	1	0.3	0.4	58
Sciatic artery runs medial ventral	1	0.3	0.4	58

Rarely, the internal pudendal artery provides a supply to the hip joint and sciatic nerve via anastomotic and sciatic branches. Observations based on 342 specimens.

Table A.61: Sciatic artery branches in the gluteal region

Branch	Frequency	Incidence (%)	Incidence without missing (%)	Missing
Ar Br	61	17.8	20.3	41
Ar Br Ventrally	12	3.5	4.0	41
Ar Br Dorsally	49	14.3	16.3	41
Sciatic Br	62	18.1	20.6	41
Sciatic Br Ventrally	5	1.5	1.7	41
Sciatic Br Dorsally	48	14.0	15.9	41
Sciatic Br Ventrally & Dorsally	9	2.6	3.0	41
Sciatic Artery Penetration	19	5.6	6.3	39
SA pass superior PM	2	0.6	0.7	39
SA pass inferior PM	65	19.1	21.4	39
SA Provide M Br	6	1.8	2.0	39
SA provide coccegeal Br	6	1.8	2.0	39

The sciatic artery has different course in relation to piriformis either passing superiorly or inferiorly. It provides a supply to the hip joint and sciatic nerve via anastomotic and sciatic branches. The previous branches have different courses in relation to the sciatic nerve in either passing or penetrating. Observations based on 342 specimens.

Table A.62: Ischiadic branches in the gluteal region

Branches	Frequency	Incidence (%)	Incidence without missing (%)	Missing
Single	271	79.2	91.2	45
Double	20	5.8	6.7	45
Triple	3	0.9	1.0	45
CAB	3	0.9	1.0	45

Ischiadic branch is not the sciatic artery but it is any terminal branch of any artery supplying the sciatic nerve in the gluteal region. It was found to be single, double and triple, whereas it was found to be absent occasionally. Observations based on 342 specimens.

Table A.63: Origins of an ischiadic branch in the gluteal region

Branch	Frequency	Incidence (%)	Incidence without missing (%)	Missing
IGA	221	64.6	74.4	45
IGA IPA	2	0.6	0.7	45
IGA IPA SA	3	0.9	1.0	45
IGA SA	17	5.0	5.7	45
IGA SGA	1	0.3	0.3	45
IPA	6	1.8	2.0	45
SA	43	12.6	14.5	45
SGA	1	0.3	0.3	45
CAB	3	0.9	1.0	45

An ischiadic branch is not the sciatic artery but it is any terminal branch of any artery supplying the sciatic nerve in the gluteal regions such as superior and inferior gluteal artery as well as sciatic artery and internal pudendal artery. It can be single, double and triple. Observations based on 342 specimens.

IV. Variability of sciatic nerve course and arterial blood supply in European population

Table A.64: Sciatic nerve course in European population

Bifurcation level	Frequency	Incidence (%)	Incidence without missing (%)	Missing
Upper division	46	13.5	14.5	25
Middle division	66	19.3	20.8	25
Lower division	154	45.0	48.6	25
Delayed division (IKJ)	14	4.1	4.4	25
Ununited	37	10.8	11.7	25
United SN Extrapelvic	12	3.5	3.8	25
United Extrapelvic & divide upper	2	0.6	0.6	25
United extrapelvic divide middle	4	1.2	1.3	25
United extrapelvic divide lower	5	1.5	1.6	25
United extrapelvic & divide delayed IKJ	1	0.3	0.3	25
Ununited in or out pelvic	25	7.3	7.6	25
SN pass below PM	294	86.0	92.7	25
SN pass above PM	0	0	0	25
CFN pass above & TN below PM	2	0.6	0.6	25
CFN pass above & TN middle PM	0	0	0	25
TN PASS below & CFN middle PM	6	1.8	1.9	25
CFN pass below 1st & TN pass below 2nd PM	15	4.4	4.7	25

The sciatic nerve has several courses in relation to piriformis and its bifurcation level. Observations based on 342 specimens.

Table A.65: Variability of the course of the sciatic nerve associated with sciatic artery cases in European population

Bifurcation level	Frequency	Incidence (%)	Incidence without missing (%)	Missing
Upper division	5	1.5	1.6	25
Middle division	17	5.0	5.4	25
Lower division	34	9.9	10.7	25
Delayed division (IKJ)	4	1.2	1.3	25
Ununited	6	1.8	1.9	25
United SN Extrapelvic	3	0.9	0.9	25
United extrapelvic & divide upper	1	0.3	0.3	25
United extrapelvic divide middle	0	0	0	25
United extrapelvic & divide lower	2	0.6	0.6	25
United extrapelvic & divide delayed IKJ	0	0	0	25
Ununited in or out pelvic	3	0.9	0.9	25
SN pass below PM	61	17.8	19.2	25
SN pass above PM	0	0	0	25
CFN pass above & TN below PM	1	0.3	0.3	25
CFN pass above & TN middle PM	0	0	0	25
TN PASS below & CFN middle PM	1	0.3	0.3	25
CFN pass below first & TN pass below second PM	3	0.9	0.9	25

The sciatic nerve has several courses in relation to piriformis and its bifurcation level. Observations based on 342 specimens.

Table A.66: Variability of the sciatic nerve course in sciatic artery cases

Bifurcation level	Frequency	Incidence (%)	Incidence without missing (%)	Missing
Upper division	5	7.4	7.6	2
Middle division	17	25	25.8	2
Lower division	34	50	51.5	2
Delayed division (IKJ)	4	5.9	6.1	2
Ununited	6	8.8	9.1	2
United SN extrapelvic	3	4.4	4.5	2
United extrapelvic divide upper	1	1.5	1.5	2
United extrapelvic divide middle	0	0	0	2
United extrapelvic divide lower	2	2.9	3.0	2
United extrapelvic divide at delayed IKJ	0	0	0	2
Ununited in or out pelvic	3	4.4	4.5	2
SN pass below PM	61	89.7	92.4	2
SN pass above PM	0	0	0	2
CFN pass above & TN below PM	1	1.5	1.5	2
CFN pass above & TN middle PM	0	0	0	2
TN pass below & CFN middle PM	1	1.5	1.5	2
CFN pass below 1st & TN pass below 2nd PM	3	4.4	4.5	2

With coexisting sciatic artery, the sciatic nerve has several courses in relation to piriformis and its bifurcation level. Observations based on 68 specimens.

Table A.67: Ununited sciatic nerve course and its supply

Bifurcation level	Frequency	Incidence (%)	Incidence without missing (%)	Missing
Ununited	37	100	100	0
United SN extrapelvic	12	32.4	32.4	0
United extrapelvic divide upper	2	5.4	5.4	0
United extrapelvic divide middle	4	10.8	10.8	0
United extrapelvic divide lower	5	13.5	13.5	0
United Extrapelvic Divide Delayed IKJ	1	2.7	2.7	0
Ununited In or out pelvic	25	67.6	67.6	0
SN pass below PM	14	37.8	37.8	0
SN pass above PM	0	0	0	0
CFN pass above & TN below PM	2	5.4	5.4	0
CFN pass above & TN middle PM	0	0	0	0
TN pass below & CFN middle PM	6	16.2	16.2	0
CFN pass below first & TN pass below second PM	15	40.5	40.5	0
SGA S Br	0	0	0	7
IPA S Br	0	0	0	6
IGA S Br	28	75.7	87.5	5
SA S Br	6	16.2	17.6	3
Double source supply IGA (S Br & Ar Br)	25	67.6	78.1	5
Double source supply IGA & SA	3	8.1	9.4	5
Double source supply SA (S Br & Ar Br)	2	5.4	6.3	5
Tibial nerve supplied by IGA Ar Br	3	8.1	9.4	5
Tibial nerve supplied by IGA S Br	25	67.6	78.1	5
TIBIAL nerve supplied by SA Ar Br	2	5.4	6.3	5
CFN supply by IGA Ar Br	25	67.6	78.1	5
CFN supply by SA Ar Br	2	5.4	6.3	5
CFN supply by SA S Br	3	8.1	9.4	5

The sciatic nerve has different levels of bifurcation leading to various arterial supply. Observations based on 37 specimens.

V. Internal Iliac Artery Classification

Table A.68: This study based on Adachi (1928) classification

Origin	Frequency	Incidence (%)	Incidence without missing (%)	Missing
1	116	33.9	38.1	40
2	55	16.1	18.2	40
3	110	32.2	36.4	40
4	7	2.0	2.3	40
NEW	14	4.1	4.6	40

Based on Lipshutz (1918) classification modified by Adachi (1928), 14 new patterns do not belong to any type of this classification (sciatic artery has been Identified as inferior gluteal artery). Observations based on 342 specimens.

Table A.69: Adachi (1928) classification verifying subtype

Type	Frequency	Incidence (%)	Incidence without missing (%)	Missing
1A	60	17.5	19.9	40
1B	56	16.4	18.5	40
2A	19	5.6	6.3	40
2B	36	10.5	11.9	40
3	110	32.2	36.4	40
4	7	2.0	2.3	40
NEW	14	4.1	4.6	40

Based on a modified Lipshutz classification via Adachi (1928), first type and second type is divided into subtype A and B (sciatic artery has been Identified as inferior gluteal artery). Observations based on 342 specimens.

Table A.70: This study based on Adachi (1928) classification incidence

Type	Frequency	Incidence (%)	Incidence without missing (%)	Missing
1A	58	17.0	19.2	40
1B	51	14.9	16.9	40
2A	16	4.7	5.3	40
3	105	30.7	34.8	40
4	7	2.0	2.3	40
FALS	51	14.9	16.9	40
NEW	14	4.1	4.6	40

As Lipshutz identified the sciatic artery as inferior gluteal artery, some false pattern have been existed. False pattern of the sciatic artery has been identified as the inferior gluteal artery in case of the latters absence or arising distally from either the previous artery or gluteopudendal trunk, therefore the latter trunk pretends as internal pudendal artery. Conclusively, this study showed failure of the previous internal iliac artery classification in identifying the classical pattern of this artery in 21.5% in case of sciatic artery coexistence or congenital absence of the inferior gluteal artery. Observations based on 342 specimens.

Table A.71: Current study based on new IIA classification

Type	Frequency	Incidence (%)	Incidence without missing (%)	Missing
1A	58	17.0	19.2	40
1B	51	14.9	16.9	40
2A	16	4.7	5.3	40
3	105	30.7	34.8	40
4	7	2.0	2.3	40
Atypical substitutive Type I A	6	1.8	2.0	40
Atypical substitutive Type I B	4	1.2	1.3	40
Atypical substitutive Type II A	33	9.6	10.9	40
Atypical substitutive Type III	16	4.7	5.3	40
Atypical Type I SA2	2	0.6	0.7	40
Atypical Type III SA	1	0.3	0.3	40
Atypical Type IV SA	3	0.9	1.0	40

According to the current study classification, the previous classifications types have not changed to avoid confusion. Further current types are clarified occurring at different rates. Observations based on 342 specimens.

Table A.72: This study based on new IIA classification in females

Type	Frequency	Incidence (%)	Incidence without missing (%)	Missing
1A	35	22.2	24.3	14
1B	22	13.9	15.3	14
2A	7	4.4	4.9	14
3	44	27.8	30.6	14
4	3	1.9	2.1	14
Atypical substitutive Type I A	0	0	0	14
Atypical substitutive Type I B	3	1.9	2.1	14
Atypical substitutive Type II A	19	12.0	13.2	14
Atypical substitutive Type III	7	4.4	4.9	14
Atypical Type I SA2	2	1.3	1.4	14
Atypical Type III SA	1	0.6	0.7	14
Atypical Type IV SA	1	0.6	0.7	14

In females, the type has different incidence from males indicating gender may have a vital role. Observations based on 158 specimens.

Table A.73: Current study based on new IIA classification in males

Type	Frequency	Incidence (%)	Incidence without missing (%)	Missing
1A	23	12.5	14.6	26
1B	29	15.8	18.4	26
2A	9	4.9	5.7	26
3	61	33.2	38.6	26
4	4	2.2	2.5	26
Atypical substitutive Type I A	6	3.3	3.8	26
Atypical substitutive Type I B	1	0.5	0.6	26
Atypical substitutive Type II A	14	7.6	8.9	26
Atypical substitutive Type III	9	4.9	5.7	26
Atypical Type I SA2	0	0	0	26
Atypical Type III SA	0	0	0	26
Atypical Type IV SA	2	1.1	1.3	26

In males, the type has different incidence from females indicating gender and may have a vital role. Observations based on 184 specimens.

VI. Worldwide literature review of sciatic artery aneurysm cases

The present study includes a review of 206 case of 171 patients (male: 43 and female: 89) from 1864 to 2012 identifying sciatic artery aneurysm incidence by gender and age, as well as pathology and classical presentation of the disease. Moreover, it includes the gold standard diagnosis of sciatic artery disorder. Based on the Bower et al (1977) classification, it clarifies the incidence of complete and incomplete forms and architecture of femoral system.

Table A.74: Incidence of sciatic artery in both genders

Gender	Frequency	Incidence (%)	Incidence without missing (%)	Missing
Female	89	43.4	67.4	74
Male	43	20.8	32.6	74

On gender comparison, sciatic artery aneurysm was found to be more in females than in males. (Based on literature review, 74 patients have not been clarified to be male or female). Observations based on 206 cases.

Table A.75: Age group Incidence of sciatic artery in 206 cases

Age	Frequency	Incidence (%)	Incidence without missing (%)	Missing
Up to 10 years	3	1.5	2.3	78
From 10 to 20 years	8	3.9	6.1	78
From 20 to 30 years	3	1.5	2.3	78
From 30 to 40 years	1	0.5	0.8	78
From 40 to 50 years	12	5.9	9.1	78
From 50 to 60 years	19	9.2	14.4	78
From 60 to 70 years	29	14.1	22.0	78
From 70 to 80 years	16	7.8	12.1	78
From 80 to 90 years	13	6.3	10.2	78
From 90 to 100 years	2	1.0	1.5	78

Based on the literature review, sciatic artery aneurysm occurred in different decades. It was more frequent from 40 to 90; it is highly diagnosed on seventh decades. However, the age has not been identified in 78 cases. Observations based on 206 cases.

Table A.76: Age group incidence of sciatic artery in population

Age	Frequency	Incidence (%)	Incidence without missing (%)	Missing
Up to 10 years	3	1.5	2.8	100
From 10 to 20 years	8	3.9	7.5	100
From 20 to 30 years	3	1.5	2.8	100
From 30 to 40 years	1	0.5	0.9	100
From 40 to 50 years	12	5.9	11.3	100
From 50 to 60 years	19	9.2	17.9	100
From 60 to 70 years	29	14.1	27.4	100
From 70 to 80 years	16	7.8	15.1	100
From 80 to 90 years	13	6.3	12.3	100
above 90 years	2	1	1.9	100

Sciatic artery aneurysm occurred frequently in the seventh decade in a worldwide population excluding 22 sciatic arteries which were bilateral or normal. Observations based on 206 cases.

Table A.77: Incidence of sciatic artery origin

Origin	Frequency	Incidence (%)	Incidence without missing (%)	Missing
IIA	75	36.4	91.5	124
AT IIA	3	1.5	3.7	124
IGA	3	1.5	3.7	124
CIA	1	0.5	1.2	124

The sciatic artery is usually a continuation of the internal iliac artery. It occasionally originates from its trunks or branches. Rarely, it was found to be a continuation of the common iliac artery. Observations based on 206 cases.

Table A.78: Incidence of complete and in complete form of sciatic artery

Type	Frequency	Incidence (%)	Incidence without missing (%)	Missing
Complete	141	68.4	86.5	43
Incomplete	15	7.3	9.2	43
Non classified	7	3.4	4.3	43

Based on the Bower et al (1977) classification, the sciatic artery divides into complete and incomplete forms: the complete form was found to be main form associated with sciatic artery aneurysm. Observations based on 206 cases.

Table A.79: Incidence of sciatic artery in uni and bilateral side population

Side	Frequency	Incidence (%)	Incidence without missing (%)	Missing
Unilateral	122	59.2	77.2	48
Bilateral	36	17.5	22.8	48

Presence of the sciatic artery can be divides into unilateral and bilateral. The unilateral form has occurred more than the unilateral. Observations based on 206 cases.

Table A.80: The sciatic artery termination course

Incidence	Frequency	Incidence (%)	Incidence without missing (%)	Missing
Trifurcation	1	0.5	0.6	48
Collateral circulation	10	4.9	6.3	48
Popliteal	133	64.6	84.2	48
At thigh	14	6.8	8.9	48

Based on radiological description, the sciatic artery termination was found to continue as popliteal artery rather than terminating as a trifurcation at collateral circulation or any level of the thigh with neither major nor minor branch distribution. Observations based on 206 cases.

Table A.81: Superficial femoral artery size and course

Incidence	Frequency	Incidence (%)	Incidence without missing (%)	Missing
Size				
Aplasia	10	4.9	8.8	92
Hypoplasia	76	36.9	66.7	92
Regular	28	13.6	24.6	92
Course				
Collateral circulation	9	4.4	7.9	92
Popliteal	11	5.3	9.6	92
Thigh	84	40.8	73.7	92
Number				
Single	103	50.0	90.4	92
More than one	1	0.5	0.9	92
CAB	10	4.9	8.8	92

The superficial femoral artery has variable size and course in association with the sciatic artery. It is commonly found to be hypoplastic with an early termination at any level of the thigh. Observations based on 206 cases.

Table A.82: Deep femoral artery size and course

Incidence	Frequency	Incidence (%)	Incidence without missing (%)	Missing
Size				
Aplasia	7	3.4	15.2	160
Hypoplasia	10	4.9	21.7	160
Hyperplasia	2	1.0	4.3	160
Regular	27	13.1	58.7	160
Course				
Collateral circulation	1	0.5	2.2	160
Popliteal	1	0.5	2.2	160
Thigh	37	18.0	80.4	160
CAB	7	3.4	15.2	160

The deep femoral artery has variable size and course in association with a sciatic artery. It is commonly found to be regular with an early termination at any level of the thigh. Observations based on 206 cases.

Table A.83: Popliteal pulse

Incidence	Frequency	Incidence (%)	Incidence without missing (%)	Missing
Clinically absent	25	12.1	59.5	164
Decrease	6	2.9	14.3	164
Normal	11	5.3	26.2	164

In coexisting sciatic artery aneurysm, the popliteal pulse was found to be frequently impalpable. Observations based on 206 cases.

Table A.84: Dorsalis Pedis Pulse

Incidence	Frequency	Incidence (%)	Incidence without missing (%)	Missing
Clinically absent	26	12.6	65.0	166
Decrease	7	3.4	17.5	166
Normal	7	3.4	17.5	166

In coexisting sciatic artery aneurysm, the dorsalis pedis pulse was found to be frequently impalpable. Observations based on 206 cases.

Table A.85: Method of Study

Incidence	Frequency	Incidence (%)	Incidence without missing (%)	Missing
Anatomy	17	8.3	8.5	7
Radiology	182	88.3	91.5	7
■ **Angiography**	97	47.1	72.4	72
■ **CT**	5	2.4	3.7	72
■ **Combined Angiographic CT**	32	15.5	23.9	72
■ **Combined Angiographic MRI**	4	1.9	3.0	72
■ **Combined CT and MRI**	2	1.0	1.5	72
■ **US**	9	4.4	6.7	72
■ **Venography**	2	1.0	1.5	72

The sciatic artery cases diagnosed in different studies, radiological as well as anatomical. 48 cases did not mention the type of radiology study; as well as 17 have been identified by anatomical dissection with previous 7 missed cases giving a total of missing data as 72. Observations based on 206 cases.

Table A.86: Pathology of sciatic artery

Incidence	Frequency	Incidence (%)	Incidence without missing (%)	Missing
Atherosclerosis	1	0.5	0.5	14
Embolism	10	4.9	5.2	14
Embolism and thrombosis	22	10.7	11.5	14
Healthy sciatic artery with no findings	50	24.3	26.0	14
Aneurysm only	73	35.4	38.0	14
Rupture hematoma	2	1.0	1.0	14
Thrombosis only	34	16.5	17.7	14

Based on pathological investigation, the sciatic artery has an aneurysm or not, but found to have atherosclerosis, embolism, thrombosis or rupture hematoma and a combination of embolism and thrombosis. Observations based on 206 cases.

Table A.87: Pathology of sciatic artery with no aneurysm

Incidence	Frequency	Incidence (%)	Incidence without missing (%)	Missing
Atherosclerosis	1	0.5	0.5	14
Embolism	2	1.0	1.0	14
Embolism and thrombosis	5	2.4	2.6	14
Rupture hematoma	1	0.5	0.5	14
Thrombosis only	4	1.9	2.1	14

Based on pathological investigation, the sciatic artery without aneurysm was found to have only atherosclerosis, embolism, thrombosis or rupture hematoma and a combination of embolism and thrombosis. Observations based on 206 cases.

Table A.88: Pathology of sciatic artery aneurysm

Incidence	Frequency	Incidence (%)	Incidence without missing (%)	Missing
Embolism	8	3.9	4.2	14
Embolism and thrombosis	17	8.3	8.9	14
Rupture hematoma	1	0.5	0.5	14
Thrombosis only	30	14.6	15.6	14

Based on pathological investigation, the sciatic artery with aneurysm was found to have only embolism, thrombosis or rupture hematoma and a combination of embolism and thrombosis. Observations based on 206 cases.

Table A.89: Final clinical diagnosis of sciatic artery

Incidence	Frequency	Incidence (%)	Incidence without missing (%)	Missing
Normal	70	34.0	35.4	8
Aneurysm	128	62.1	64.6	8

Based on several conditions which mimic intermittent claudication syndrome, the final diagnosis of sciatic artery cases found to be free from abnormalities was 70 cases, whereas 128 has been defined as sciatic artery aneurysm and 8 case with no diagnosis. Observations based on 206 cases.

Table A.90: Clinical disorders associated with sciatic artery aneurysm

Incidence		Frequency	Incidence (%)	Incidence without missing (%)	Missing
Aortic arch branches	Aberrant right subclavian	1	0.5	0.7	53
	Aortoiliac aneurysim	2	1.0	1.3	53
	Carotid variation	1	0.5	0.7	53
	Internal carotid Aneurysm	1	0.5	0.7	53
	Aortic Cortication	2	1.0	1.3	53
Iliac system branch anomaly	Congenital absent of external iliac artery	1	0.5	0.7	53
	Hypoplasia of EIA	9	4.4	5.9	53
	Hyperplasia IIA	5	2.4	3.3	53
	Internal iliac artery aneurysm	1	0.5	0.7	53
	Large lumen IIA	4	1.9	2.6	53
	IGA Coexistence A	1	0.5	0.7	53
	IGA Congenital Absence	1	0.5	0.7	53
Femoral system branches	Congenital absence of common femoral artery	2	1.0	1.3	53
	Popliteal aplasia	1	0.5	0.7	53
	Popliteal ETM	5	2.4	3.3	53
	Poplitealbr ETM	3	1.5	2.0	53
	Tibial ETM	1	0.5	0.7	53
Hepatic function disorder	Hepatocellular carcinoma	1	0.5	0.7	53
	Hibatitis B	1	0.5	0.7	53
	Hypercholesterolemia- lipidemia	2	1.0	1.3	53
Chronic Disorder	Hyperparathyroidism	1	0.5	0.7	53
	Diabetes mellitus	7	3.4	4.6	53
	Hypertension	6	2.9	3.9	53
	Obesity	4	1.9	2.6	53
	Chronic obstructive pulmonary disease	3	1.5	2.0	53
Autoimmune and infective vasculitis	Burgor's disease	1	0.5	0.7	53
	Rheumatoid arthritis	2	1.0	1.3	53
	Systemic lupus erythematus	1	0.5	0.7	53
	Raynaud's phenomenon	1	0.5	0.7	53
	Venereal Disease Research Laboratory positive	1	0.5	0.7	53
Venous system	Varicosity	5	2.4	3.3	53
	Deep venous thrombosis	1	0.5	0.7	53
	Arteriovenous malformation	2	1.0	1.3	53
Renal disease	Polycyctic ovarian disease	6	2.9	3.9	53
	Chronic renal failure	3	1.5	2.0	53
	Post kidney transplant	1	0.5	0.7	53
	Dialysis & hemodialysis	3	1.5	2.0	53
	Renal cell carcinoma nephrectomy	1	0.5	0.7	53
	Solitary pelvic kidney	1	0.5	0.7	53
Cardiac disease	Atrial fibrillation	1	0.5	0.7	53
	Myocardial infarction	2	1.0	1.3	53
	Coronary artery disease	2	1.0	1.3	53
	Ischemic heart disease	1	0.5	0.7	53
Tumor	Neurofibromatosis	1	0.5	0.7	53
	Schwannoma	1	0.5	0.7	53
	Infentile pelvic haemangioma	1	0.5	0.7	53
Congenital limb deformities	Overlap syndrome	1	0.5	0.7	53
	Double knee	1	0.5	0.7	53
	Double tibia	1	0.5	0.7	53
	Amniotic band syndrome	1	0.5	0.7	53
	Hemihypertrophy	1	0.5	0.7	53
	Soft tissue hypertrophy	1	0.5	0.7	53
Other condition	Tethered cord	1	0.5	0.7	53
	imperforate anus	1	0.5	0.7	53
	Atherosclerotic change	2	1.0	1.3	53
	Stroke	2	1.0%	1.3	53
Obstetric & gynecology	Cervix tumor	1	0.5%	0.7	53
	Hystrectomy	1	0.5%	0.7	53
Other condition	Tethered cord	1	0.5%	0.7	53
	imperforate anus	1	0.5%	0.7	53
	Atherosclerotic change	2	1.0%	1.3	53
	Stroke	2	1.0%	1.3	53
SMOKER		6	2.9%	3.9	53

Sciatic artery aneurysm was found to be associated with several coexisting conditions during diagnosis. Therefore, these conditions can be considered to reflect essential risk factors of sciatic artery aneurysm. Observations based on 206 cases.

Table A.91: Sciatic artery aneurysm site

Incidence	Frequency	Incidence (%)	Incidence without missing (%)	Missing
Complete sciatic artery aneurysm	3	1.5	5.6	152
Pelvic	3	1.5	5.6	152
Gluteal	41	19.9	75.9	152
Distal	2	1.0	3.7	152
Thigh	5	2.4	9.3	152

Sciatic artery aneurysm may occur in the proximal, middle or distal thigh: usually occurs the gluteal region. Observations based on 206 cases.

Table A.92: Sciatic artery aneurysm associated with other artery aneurysm

Incidence	Frequency	Incidence (%)	Incidence without missing (%)	Missing
abdominal aortic artery aneurysm	1	0.5	0.8	77
Common femoral artery aneurysm	1	0.5	0.8	77
Internal iliac artery aneurysm	4	1.9	3.1	77
Tibial artery Aneurysm	1	0.5	0.8	77

Sciatic artery aneurysm associated with other artery aneurysm, such as abdominal aortic, common femoral artery, internal iliac artery and tibial artery. Observations based on 206 cases.

Table A.93: Reason of sciatic artery aneurysm diagnosis

Incidence	Frequency	Incidence (%)	Incidence without missing (%)	Missing
Atypical sciatica	19	9.2	11.5	41
Gun shot	2	1.0	1.2	41
Intermittent claudication symptoms	74	35.9	44.8	41
Incidentally	42	20.4	25.5	41
Atrophic right lower extremity	1	0.5	0.6	41
Gluteal mass	16	7.8	9.7	41
Ischemic toe	11	5.3	6.7	41

Sciatic artery aneurysm has been recorded to have different clinical presentations prior to diagnosis, such as atypical sciatica, intermittent claudication symptoms, atrophic right lower extremity, gluteal mass and ischemic toe. Occasionally, it has been diagnosed incidentally as well as with gunshot wounds which is in total 7.9%. Observations based on 206 cases.

Table A.94: Incidence of trauma rate in sciatic artery aneurysm condition

Incidence	Frequency	Incidence (%)	Incidence without missing (%)	Missing
Trauma	5	2.4	3.9	76
No trauma	125	60.7	96.1	76

Sciatic artery aneurysm was found to occur in trauma in 3.9%. Observations based on 206 cases.

Table3.95: Sciatic artery aneurysm associated with mass

Incidence	Frequency	Incidence (%)	Incidence without missing (%)	Missing
Painful mass	2	1.0	1.3	50
Pulsatile mass	42	20.4	26.9	50
Incidentally	1	0.5	0.6	50
No mass	111	53.9	71.2	50

Sciatic artery aneurysm has been associated with a gluteal mass which can be divided into painful and pulsating mass clinically. A silent mass has been discovered by routine radiology investigation. Clinically, the palpable gluteal masses are 16 whereas the 42 are diagnosed via radiological procedures. Observations based on 206 cases.

Table A.96: Prognosis

Incidence	Frequency	Incidence (%)	Incidence without missing (%)	Missing
Toe amputation	1	0.5	0.7	55
Amputation	10	4.9	6.6	55
Total amputation	11	5.3	7.3	55
Died	5	2.4	3.3	55
Faild operation	1	0.5	0.7	55
Recurrent intermittent claudication	1	0.5	0.7	55
Post partum hemorrhage	2	1.0	1.0	55
Recurrent aneurysm	5	2.4	3.3	55
Foot drop	1	0.5	0.7	55
No complication	104	50.5	68.9	55
Oral conservative treatment	4	1.9	2.6	55
Anatomy	17	8.3	11.3	55

Medical conservative treatment and surgical intervention of sciatic artery aneurysm is associated with various complications, such as recurrence, amputation or death. Observations based on 206 cases.